

UAS-Unmanned Aircraft Systems Training 1st – 4th November 2019



On November 1-4th 2019, World Food Program (WFP) and WeRobotics teamed up with Nepal Flying Labs to run a 5-day hands-on training and disaster simulation to improve the rapid deployment and coordination of drones in humanitarian action. WFP previously designed and ran similar humanitarian drone trainings and simulations with WeRobotics (and others) in the Dominican Republic, Peru, Myanmar, Malawi and Mozambique.

Training Agenda:

- 1) **Day 1:** training & presentations on local drone activities, coordination, drone mapping and software.
- 2) **Day 2:** Drone regulations, coordination in emergencies, code of conduct, mission planning, data protection.
- 3) **Day 3:** Operational flights, image processing and analysis, preparation for simulation exercise
- 4) **Day 4:** Disaster response simulation
- 5) **Day 5:** Debriefing and lessons learned review, panel discussion, closing.



Objectives of the training:

- Gain hands-on experience with UAS/drones planning, flights, image processing and analysis using various software and tools available.
- Practice using UAS for disaster response during a simulation exercise.
- Bring together government and humanitarian stakeholders to improve coordination to utilize UAS for preparedness and response.

The 5-day training in Nepal was largely led by Nepal Flying Labs with support by WFP and run in Nepali. 45 participants from 16 Nepali organizations participated with the training, which included an introduction to drone technologies, drone photogrammetry, imagery processing, lessons learned and best practices from past humanitarian drone missions, and overviews of codes of conduct, data protection protocols and coordination mechanisms, all drawn from direct operational experience. The training also comprised a series of presentations by Nepali experts who are already engaged in the use of drones in disaster management and other sectors in Nepal such as Civil Aviation Authority of Nepal (CAAN). In addition, the training included a co-creation session using design thinking methods during which local experts identified the most promising humanitarian applications of drone technology in Nepal.



Participants were trained on how to fly drones and program drone flights. This hands-on session, kindly hosted by Kathmandu University, was followed by another hands-on session on how to process and analyze aerial imagery. In this session, participants were introduced to Pix4Dreact and Picterra. Pix4Dreact provides an ultra-rapid solution to data processing, allowing humanitarian drone teams to process 1,000 high-resolution aerial images in literally minutes, which is invaluable as this used to take hours. Picterra enables drone teams to quickly analyze aerial imagery by automatically identifying features of interest to disaster responders such as damaged buildings, for example. While Picterra uses deep learning and transfer learning to automate feature detection, users don't need any background or prior experience in artificial intelligence to make full use of the platform. During the hands on-session, trainers used Picterra to automatically detect buildings in aerial (orthophoto) map of an earthquake-affected area.



After completing a full day of hands-on training on the second day, Nepal Flying Labs gave a briefing on the disaster simulation scheduled for the following day. The simulation required participants to put into practice everything they've learned in the training. The simulation consolidated their learning and provided them with important insights on how to streamline their coordination efforts. The drone simulation exercise was held at Bhumlu Rural Municipality, a 3+ hour drive from Kathmandu. Bhumlu is highly prone to flooding and landslides, which is why it was selected for the simulation. The simulation consisted of three teams (Authorities,

Pilots and Analysts) who worked together to identify and physically retrieve colored markers as quickly and safely as possible. The markers, which were placed across Bhumlu prior to participants' arrival, had different colors representing different subjects to be identified, e.g., Yellow = survivor; Blue = landslide; and Red = disaster damage. Myanmar has held the record for the fastest completion of the simulation in prior drone simulation exercises, since 2017, retrieving all markers in just over 4 hours. The teams from Nepal retrieved all markers in a very impressive time of 3 hours and 4 minutes, beating the number one spot of Myanmar.



The fourth and final day of the workshop consisted of a debriefing session, inviting each team and trainee to reflect on lessons learned and share their insights. For example, it was noted that feedback loops between the Pilots and Analysis Teams are important, so that pilots can plan further flights based on the maps produced by the analysts. The Analysis Teams noted that having a portal printer on hand would be ideal. The Pilots Team suggested that having different colored visibility vests would've enabled more rapid field coordination between and within teams by enabling individuals to more quickly identify who is who.

When asked which individuals or group had the most challenging job in the simulation, the consensus was the retrieval group who are part of the Authorities Team and responsible for retrieving the markers after they've been geo-located by the Analysis Team. This was particularly interesting given that in all previous simulations run, the consensus had always been

that the Analysis Team had the hardest task. These insights together with the many others gained from the training in Nepal will be added to a document on best practices in humanitarian drone missions which will be produced by WeRobotics.



After the full simulation debrief, a final session of the training was a panel discussion on the development of drone regulations to save lives and reduce suffering in Nepal. The panelists included senior officials from Civil Aviation, Home Ministry and Nepal Police. The session was run in Nepali and presented participants with an excellent opportunity to engage with and inform key policymakers. In preparation for this session, a 3-page policy document (PDF) with priority questions and policy recommendations was made by the facilitators and participants, which served as the basis for the Q&A with the panel. This policy document is attached and proposed to be considered and discussed by Ministry of Home Affairs with government and non-government stakeholders.



Participants:

- | | |
|-------------------------------------|-----------|
| 1. Min. of Home Affairs: | 3 persons |
| 2. Min. of Communications IT: | 4 persons |
| 3. Civil Aviation Authority: | 5 persons |
| 4. Survey Dept. of Nepal: | 2 persons |
| 5. Nepal Police: | 3 persons |
| 6. Armed Police Forces: | 3 persons |
| 7. Nepal Army: | 3 persons |
| 8. Land Management Training centre: | 2 persons |
| 9. Nepal Red Cross Society: | 2 persons |
| 10. Kathmandu University: | 3 persons |
| 11. ICIMOD: | 2 persons |
| 12. Unamid UNV: | 1 person |
| 13. WFP: | 5 persons |
| 14. Nepal GIS Society: | 2 persons |
| 15. Nepal Flying Lab: | 6 persons |
| 16. We Robotics: | 1 person |

Video on Youtube: Humanitarian Drone Training for the UN in Nepal

<https://www.youtube.com/watch?v=KTMSvxBK3I&feature=youtu.be>

Acknowledgements: *WFP Nepal would like to sincerely thank WeRobotics, Nepal Flying Labs and WFP HQ for the support and organization to run this training and thanks to the Belgium Government for funding this training. To all 40+ participants, a sincerest thanks for all the energy you brought to the training and for your high levels of engagement throughout each of the 5 days, which significantly enriched the training.*

Attachments:

- Nepal humanitarian drone training policy recommendations
- Agenda
- Participants list
- Post-training survey results from participants



NEPAL HUMANITARIAN DRONE TRAINING POLICY RECOMMENDATIONS 2019

Drones are becoming increasingly popular, and so is their application in humanitarian missions across the globe. Hazards and disasters result in the loss of lives and the destruction of infrastructure, often making conditions so difficult or dangerous that relief workers are unable to access affected areas to provide assistance. Nepal is one of the most disaster-prone countries in the world. As such, the use of drones for humanitarian purposes could significantly create better results in terms of emergency responses, better disaster preparedness, better situational awareness and better data for planning for hazard mitigation. Given the significant need for the use of drones in the context of Nepal, a “UAS training on coordination of drones in humanitarian action” was organised by the World Food Program (WFP) with WeRobotics and Nepal Flying Labs serve as trainers and technical partners thanks to the invaluable support of the Emergency Telecommunication Cluster and the Belgium Government.

The training comprised 45 participants representing a diverse sectors including the government authorities, INGOs, security agencies as well as private institutions. The training was aimed at sensitizing and transferring both the knowledge and the capacity to use drones in humanitarian missions safely, responsibly and effectively. In addition, the training included a full-day disaster simulation to reinforce all the learnings from the training, including best practices, standard operating procedures, codes of conduct, check-lists, imagery capture, imagery processing and imagery analysis. The training thus comprised theoretical sessions, plenary talks, presentations from leading organisations and stakeholders in the field, practical hands-on trainings and a live disaster response simulation. The training model and simulation was developed and implemented by WeRobotics in multiple countries around the globe has seen huge positive response from participants.

After acquiring hands-on knowledge on the use of drones in humanitarian action, a number of key recommendations were formulated by various participants and organising partners for consideration by the Nepal Government:

- Nepal Government is doing better in DRR related programs than in the past, but it is time that government go beyond traditional capacity building practices and trainings, and focus more on promoting practically-oriented DRR simulations with drones, GIS and other mapping technology, in all the provinces of Nepal along with special focus on disaster prone areas.
- Its has been clear to all the stakeholders that drones play a vital role in today's DRR scenarios. To this end, Nepal Government needs to promote research, development and manufacture of drone technology inside Nepal. They also need to provide dedicated air space (drone corridors) to researchers and makers to test, practice and refine their technology. We recommend that the government define such drone corridors possibly within or near Kathmandu Valley, providing ease of access to numerous drone professionals and academicians, while at the same time addressing the need to make the research dedicated airspace at a safe distance from settlements, existing airspace and sensitive areas. An increasing number of governments around the world are establishing drone corridors. Nepal Government thus has the benefit of learning from others in this space.



- Considering the huge benefits of drones and related robotics technologies in disaster response and humanitarian action, Nepal Government needs to formulate a simple set of regulations under the coordination with National Emergency Operations Center (NEOC) for emergency situations to help speed up recovery and response, while keeping the policies strict enough to prevent unauthorized drone users from operating.
- Nepal Government needs to develop a single digital platform that can track/record all drone activities in the country instead of traditional record keeping system where its highly impractical to track the use of drones within the country. An increasing number of governments around the world are setting up such digital platforms. Nepal Government thus has the benefit of learning from others in this space.
- Everyone with a drone is basically a drone pilot in Nepal. The ever increasing number of drone pilots is only going to create a worse situation for proper management with the lack of clear set of standards. Hence, Nepal Government needs to dedicate an authority and create standards defining “A professional drone pilot”, and create provisions for certification examinations that would only allow strict professionals to operate legally. For this, Nepal Government could partner with existing drone based service providers in the country and begin working on preparation of such a set of standards and certification examinations. An increasing number of governments around the world are setting up such certification standards. Nepal Government thus has the benefit of learning from others in this space.
- There is a strong need to organize more sensitization and awareness raising activities regarding the potential benefits and threats of this technology so that more people and organizations would be aware about the potential of this technology.
- Visit Nepal 2020 is actively promoting tourism in Nepal and planning to attract a significant number of tourists. Many of these tourists may bring their photography / videography equipment including drones. Instead of strictly discouraging the use of drones, the Nepal Government should design a more targeted policy to sensitize foreigners regarding the policies and the proper way of using drones in Nepal. For instance, installation of many information boards in airport arrivals and customs, banners with info on the policies, requirement to register the drone at customs, etc. An increasing number of governments around the world are already implementing these policies. Nepal Government thus has the benefit of learning from others in this space.
- Drones are associated with invasion of privacy and other security threats but also have the ability to save lives and reduce suffering in humanitarian disasters. Considering the very sensitive nature of this technology, Nepal Government must design strong monitoring plans in addition to the set of rules that controls the use of this technology so that humanitarian and other safe actions like R&D are encouraged while threat activities are prevented.
- Most of cargo drones used for medical deliveries and other health aid purpose are relatively heavier than mapping drones, i.e., they are large C category drones as dictated by the policies of Nepal. The Nepal Government needs to create a mechanism to enable trusted and professional organizations who meet relevant standards in terms of operations and project execution for such important life saving projects. The Government should also design flexible policies for such projects.



Humanitarian Drone Training 2019 Event Flow Agenda

Day 1 – 4th November 2019

| Time | Activity | Presenters/Resource Person | Location / Requirements | Notes |
|------------------------------------|--------------------------------------------------------------------------|----------------------------|-------------------------|-----------|
| 8:30-9:15 | Breakfast | | Hotel Greenwich, Sanepa | |
| 9:15-9:30 | Registration | | Hotel Greenwich, Sanepa | |
| 9:30-10:00 | Event Opening | WFP | Hotel Greenwich, Sanepa | |
| 1:00-10:15 | Welcoming and Self-introduction | WFP | Hotel Greenwich, Sanepa | |
| 10:15-10:30 | Participants share key objectives & Trainers share Training goals | Open | Hotel Greenwich, Sanepa | |
| 10:30-11:00 Short Tea Break | | | | |
| 11:00-11:30 | Presentation on National/Local disaster response from local stakeholders | Nepal Police | Hotel Greenwich, Sanepa | Confirmed |
| 11:30-11:45 | Q & A Session | Open | | |
| | Presentation on Local drone projects from local stakeholder | | Hotel Greenwich, Sanepa | |
| 11:45-12:00 | Nepal Flying Labs & Rise of UAV Use in NEPAL Post Gorkha Earthquake | Nepal Flying Labs | Hotel Greenwich, Sanepa | Confirmed |
| 12:00-12:15 | National Mapping Agency ongoing and planned drone activities. | Survey Department of Nepal | Hotel Greenwich, Sanepa | Confirmed |
| 12:15-12:30 | Drones for Glacial Mapping | ICIMOD | Hotel Greenwich, Sanepa | Confirmed |
| 12:30-1:30 Lunch Break | | | | |



| | | | | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------|-----------|
| 1:30-1:45 | UAV trainings and programs to Surveying and Mapping Professionals at LMTC | Land Management Training Center | Hotel Greenwich, Sanepa | Confirmed |
| 2:00-2:15 | Academia | Kathmandu University | Hotel Greenwich, Sanepa | Confirmed |
| 2:15-3:30 | Let's Coordinate Open discussions on challenges and opportunities as defined by local stakeholders (using design-thinking methodology developed by WeRobotics). | WeRobotics and Nepal Flying Lab | Hotel Greenwich, Sanepa | |
| 3:30-4:00 | Introduction to WeRobotics and Flying Labs with key focus on localization + Q&A | WeRobotics and Nepal Flying Lab | Hotel Greenwich, Sanepa | |
| 4:00-4:30 | Let's Fly, Let's Map Introduction to Drone Technology and Software Introduction to Imagery Processing and Analysis (including AI solutions) | WeRobotics and Nepal Flying Lab | Hotel Greenwich, Sanepa | |
| 4:30 -5:00 High Tea | | | | |

Day 2 – 5th November 2019

| Time | Activity | Presenters/Resource Person | Location / Requirements | Notes |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------|-------|
| 8:30-9:15 | Breakfast | | Hotel Greenwich, Sanepa | |
| 9:15-9:45 | Let's Coordinate Presentations on Drone regulations and guidelines Open discussions to define regulatory challenges and opportunities | CAAN | Hotel Greenwich, Sanepa | |
| 9:45-10:15 | Q & A Session | Open | | |
| 10:15-10:30 Group Photo | | | | |



| 10:30-11:00 Short Tea Break | | | | |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|--|
| 11:00-12:30 | Let's Coordinate Drones in Humanitarian Action - Operational Deployments (including cargo cases) Drones in Humanitarian Action - Lessons Learned (both tactical and operational) | WeRobotics | Hotel Greenwich, Sanepa | |
| 12:30-1:00 | Q & A Session | Open | Hotel Greenwich, Sanepa | |
| 1:00-1:45 Lunch Break | | | | |
| 1:45-2:45 | Let's Coordinate Drones in Humanitarian Action - Code of Conduct Drones in Humanitarian Action - Data Protection Drones in Humanitarian Action - Coordination Mechanisms | WeRobotics | Hotel Greenwich, Sanepa | |
| 2:45-3:00 | Q & A Session | Open | Hotel Greenwich, Sanepa | |
| 3:00-4:00 | Preparation for Day 3: Lets Fly and Lets Map Introduction to Drone Photogrammetry and Mission Planning | Nepal Flying Labs | Hotel Greenwich, Sanepa | |
| 4:00-4:30 High-Tea | | | | |

Day 3 – 6th November 2019

| Time | Activity | Presenters/Resource Person | Location / Requirements | Notes |
|-----------------------------------------------------------------|------------------|----------------------------|-------------------------|----------------------|
| 7:30-8:00 | Breakfast | | Hotel Greenwich, Sanepa | Please come on time. |
| 8:10-10:10 Travelling to field site (Departing sharply at 8:10) | | | | |
| 10:10-10:30 Tea Break | | | | |



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|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------|-----------------------------------|
| 10:30-12:30 | Hands-on Applications: Mission Planning and Operational Flights | WeRobotics /Nepal Flying Labs | Dolalghat/Dhulikhel Kathmandu University | |
| 12:30-1:00 Group Photo | | | | |
| 1:00-1:30 Lunch Break | | | | |
| 1:30-3:00 | Let's Map Hands-on Applications: Imagery Processing and Analysis (Includes pix4d, AI and qgis) | WeRobotics/Nepal Flying Labs | KU/Dhulikhel Kathmandu University | Please Bring your personal laptop |
| 3:00-3:15 Tea and Coffee Break | | | | |
| 3:15-3:45 | Simulation Preparation: Let's Coordinate, Let's Fly, Let's Map Introduction and preparation for full-day disaster response simulation | WeRobotics/Nepal Flying Labs | KU/Dhulikhel Kathmandu University | Please bring your personal laptop |
| 3:45-5:45 Travelling back to Hotel Greenwhich | | | | |

Day 4 – 7th November 2019

| Time | Activity | Presenters/Resource Person | Location / Requirements | Notes |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------|--------------------------|-----------------------------------|
| 7:30-8:00 | Breakfast | | Hotel Greenwhich, Sanepa | Please come on time. |
| 8:10-10:10 Travelling to field site (Departing sharply at 8:10) | | | | |
| 10:10-10:30 Tea Break | | | | |
| 10:30-12:30 | Let's Coordinate, Let's Fly, Let's Map Full day disaster response simulation | WeRobotics /Nepal Flying Labs | Dolalghat | |
| 12:30-1:30 Lunch Break | | | | |
| 1:30-2:30 | Full day disaster response simulation | WeRobotics/Nepal Flying Labs | Dolalghat/KU, Dhulikhel | Please Bring your personal laptop |
| 2:30-3:00 Group Photo & Tea Break | | | | |
| 3:00-3:30 | End of day debrief on lessons learned | WeRobotics/Nepal Flying Labs | Dolalghat/ KU, Dhulikhel | Please bring your personal laptop |
| 3:30-5:30 Travelling back to Hotel Greenwhich | | | | |



Day 5 – 8th November 2019

| Time | Activity | Presenters/Resource Person | Location / Requirements | Notes |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------|------------------------------------|
| 8:30-9:00 | Breakfast | | Hotel Greenwich, Sanepa | Please come on time. |
| 9:00-10:30 | Let' s Coordinate Review of lessons learned from simulation (Gap Analysis) Development of best practices based on lessons learned Development of coordination checklist | | | |
| 10:30-10:45 Tea Break | | | | |
| 10:45-12:30 | Panel Discussion Regulating Drones Activities for Social Good and Humanitarian Response in Nepal Panelists: Civil Aviation/Department of Aviation Safety, Ministry of Home Affairs, Ministry of Communication and Information technology, Nepal Police, WeRobotics Open discussion on follow-up needs from local stakeholders and plan of action to ensure continuity post-training | WFP/NFL | Hotel Greenwich, Sanepa | Panelists not yet confirmed |
| 12:30-12:45 Group Photo | | | | |
| 12:45-1:30 Lunch Break | | | | |
| 1:30-2:30 | Closing ceremony | | Hotel Greenwich, Sanepa | |
| 2:30-3:00 Tea Break | | | | |
| 3:00-3:30 | Certificate Distribution | | Hotel Greenwich, Sanepa | |
| 3:30-4:00 High Tea | | | | |

| Attendance Sheet | | | | |
|------------------|------------------------|----------------------------------------|--------------------------------------------------------------------------|------------|
| SL No. | Name | Organization | Email | Contact |
| 1 | Sambhu Regmi | Ministry of Home Affairs/NEOC | | |
| 2 | Karuna Acharya | Ministry of Home Affairs/NEOC | | |
| 3 | Indu Sharma | Ministry of Home Affairs/NEOC | | |
| 4 | Bharat P Acharya | Min. of Communications and IT | | |
| 5 | Suresh Babu Ghimire | Min. of Communications and IT | | |
| 6 | Gauri P Acharya | Min. of Communications and IT | | |
| 7 | Krishna Kumar Jha | Min. of Communications and IT | | |
| 8 | Subash Jha | | | |
| 9 | Nabin Acharya | Civil Aviation Authority of Nepal | | |
| 10 | Chuda Bahadur Khadka | Civil Aviation Authority of Nepal | | |
| 11 | Sailaja | Civil Aviation Authority of Nepal | | |
| 12 | Samrat Pradhan | Civil Aviation Authority of Nepal | | |
| 13 | Hem Dahal | Civil Aviation Authority of Nepal | | |
| 14 | Sushil Dangol | Survey Department of Nepal | susheeldangol@gmail.com | |
| 15 | Pravesh Yogal | Survey Department of Nepal | shrpravesh@gmail.com | |
| 16 | Rajib Shubba, PhD | Nepal Police | dr.rsubba@gmail.com | |
| 17 | Promod Kumar Yadhav | Nepal Police | | |
| 18 | Prem Bahadur Gandarbha | Nepal Police | | |
| 19 | Rajnis Khadka | Nepal Police | | |
| 20 | | Armed Police Force | | |
| 21 | | Armed Police Force | | |
| 22 | | Armed Police Force | | |
| 23 | Rameshwor Dulal | Nepal Army | | 9860798384 |
| 24 | Pramod Shrestha | Nepal Army | | 9826177533 |
| 25 | Mukunda Giri | Nepali Army | | 9849116726 |
| 26 | Sanjeevan Shrestha | Land Management Training Centre (LMTC) | shr.sanjeevan@gmail.com | |
| 27 | Mr. Gobinda Ghimire | Land Management Training Centre (LMTC) | | |
| 28 | Chandra Bahadur Lama | Bhumla Municipality, Kavre | | 9851203477 |
| 29 | Mr. Tirtha Pandey | Nepal Red Cross Society (NRCS) | tirtha.pandey@nrccs.org | |
| 30 | Mr. Shashank Karki | Kathmandu University | shashank.karki@ku.edu.np | |
| 31 | Uma Sankar Pandey | Kathmandu University | uspanday@ku.edu.np | |
| 32 | Subash Ghimire | Kathmandu University | subash_ghimire@ku.edu.np | |
| 33 | Rakesh Kayest | | rakesh.kayastha@ku.edu.np | |
| 34 | Finu Shrestha | ICIMOD | finu.shrestha@icimod.org | |
| 35 | Mr. Rajendra Banepali | UN Agencies | banepali@un.org | |
| 36 | Raj Lal Basukala | UNV, UNAMID SUDAN | basukala@un.org | |
| 37 | Amrit Kumar Misra | IOM | | |
| 38 | Ms. Finu shrestha | ICIMOD | finu.shrestha@icimod.org | |
| 39 | Bhawana Upadhaya | WFP | bhawana.upadhyay@wfp.org | |



| SL No. | Name | Organization | Email | Contact |
|--------|--------------------|-------------------|--------------------------------------------------------------------------|---------|
| 40 | Elizabeth Bourke | WFP | elizabeth.bourke@wfp.org | |
| 41 | Jurgen Hulst | WFP | jurgen.hulst@wfp.org | |
| 42 | Moti Thapa | WFP | moti.thapa@wfp.org | |
| 43 | Er. Anjan Maharjan | WFP | anjan.maharjan@wfp.org | |
| 44 | Aniruddha Chetri | WFP | aniruddha.chhetri@wfp.org | |
| 45 | Biplob Rakhali | WFP | biplob.rakhali@wfp.org | |
| 46 | Bishnu Maharjan | WFP | bishnu.maharjan@wfp.org | |
| 47 | Santosh Rana | WFP | santosh.rana@wfp.org | |
| 48 | Madhav Adhikari | Nepal GIS Society | | |
| 49 | Ram Gotame | Nepal GIS Society | | |
| 50 | Uttam Pudasuni | Nepal Flying Lab | uttam@flyinglabs.org | |
| 51 | Biplav Pageni | Nepal Flying Lab | | |
| 52 | Darpan Pudasaini | Nepal Flying Lab | | |
| 53 | Aneel Mandal | Nepal Flying Lab | | |
| 54 | Pukar Parajuli | Nepal Flying Lab | | |
| 55 | Subash Gurung | Nepal Flying Lab | | |
| 56 | Pravin Gyawali | Nepal Flying Lab | | |
| 57 | Patrick Mejer | WeRobotics | patrick@werobotics.org | |

POST-TRAINING SURVEY

| QUESTIONS | A | % | COMMENTS |
|----------------------------------------------|-----------|-----|------------------|
| 1. Organisation | | | |
| Humanitarian | 12 | 30% | |
| Government | 20 | 50% | |
| Academic | 2 | 5% | |
| Private sector | 3 | 8% | |
| Military | 2 | 5% | |
| Other | 1 | 3% | Inter government |
| Total | 40 | | |
| 2. Training met my expectations | | | |
| Strongly agree | 7 | 18% | |
| Agree | 33 | 83% | |
| Disagree | | 0% | |
| Strongly disagree | | 0% | |
| Total | 40 | | |
| 3. The amount of content was relevant | | | |
| Strongly agree | 9 | 23% | |
| Agree | 26 | 65% | |
| Disagree | 5 | 13% | |
| Strongly disagree | | 0% | |

| | | | |
|---------------------------------------------------------|----|-----|----|
| Total | 40 | | |
| 4. Good variety of content delivery methods | | | |
| Strongly agree | 11 | 28% | |
| Agree | 29 | 73% | |
| Disagree | | 0% | |
| Strongly disagree | | 0% | |
| Total | 40 | | |
| 5. Key takeaways | | | |
| Use of drones for post-disaster | 6 | | |
| Coordination between different stakeholders | 2 | | |
| Piloting | 4 | | |
| Rules and regulations needed for the use of UAS | 4 | | |
| Simulation | 3 | | |
| Use of drones for surveillance | | | |
| Drone safety | | | |
| Drone technology lessons learnt | | | |
| Use of drones to help beneficiaries | | | |
| Interaction with security personnel | | | |
| UAS for humanitarian response | | | |
| 6. Most beneficial outcome | | | |
| How to communicate / coordinate with others | 5 | | |
| Data / map analysis | 3 | | |
| Hands-on applications and practice | 2 | | |
| Learning the software for processing of drone images | | | 14 |
| WFP engineering unit | | | |
| Drones for post-disaster response | | | |
| Disaster management techniques + real time applications | | | |
| How to register the drone | | | |
| 7. My Favorite part was | | | |
| Simulation | 11 | | |
| Pannel discussion | 3 | | |
| Presentations from various stakeholders | 2 | | |
| Trainers | 2 | | |
| Government presentations and policy | | | |
| Interactive approach | | | |
| Teamwork | | | |
| 8. Suggestions for improvement | | | |



| | | | |
|-------------------------------------------------------------------------------------------------------------|-----------|-----|----------------------------------|
| Add extra time for hands on practice and data processing | 11 | | |
| more frequent training / refresher course | | | |
| increase the amount of simulations | | | |
| Add two days of hands on practice and data processing | | | |
| Let's COORDINATE was missing | | | |
| a mission planning session | | | |
| More dat analysis | | | |
| More equipment | | | |
| High level authorities did not participate in the pannel - they should | | | |
| The theory session is more docused on process of drone than the implementation and results | | | |
| Limit the number of participants | | | |
| Better time management | | | |
| Manual of the whole programme | | | |
| Cover more agencies | | | |
| Advanced training | | | |
| | | | |
| | | | |
| 9. Which committee would you like to join | | | |
| Policy recommendations | 13 | 25% | |
| Digitalization | 9 | 17% | |
| Emergency | 8 | 15% | |
| Data Analyst | 18 | 35% | |
| Other | 4 | 8% | drone piloting (2), research (1) |
| Total | 52 | | |
| * people indicated more than one committee hence the total number is higher than the number of participants | | | |